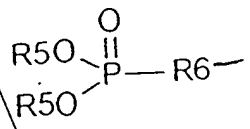
wherein A is phosphorus; X^- is an anion; and wherein R1



V

wherein R5 is a lipid moiety and R6 is alkyl of 2 to 4 carbon atoms,

R2 and R4 are alkyl of 1 to 4 carbon atoms; and R3 is selected from the group consisting of:

- alkyl of 1 to 4 carbon atoms,

CH_2-CH_2P^+(R6R7R8), R6, R7 and R8 are alkyl of 1 to 4 carbon atoms and

- CH_2-CO_2R9, and R9 is alkyl of 1 to 4 carbon atoms.

Claim 4 (twice amended) The compound of claim 1 wherein R5 is selected from the group consisting of:

(i) alkyl or alkenyl of 10 to 22 carbon atoms comprising 0, 1 or 2 olefinic double bonds,

(ii) a cholesteryl derivative or

(iii) a perfluoro alkyl of 10 to 22 carbon atoms.

Claim 5 (twice amended) The compound of claim 1, wherein the R5 is selected from the group consisting of $C_{14:0}$, $C_{18:1}$, $C_{18:2}$; $C_{15:0}$, $C_{17:0}$ or $C_{17:2}$, wherein the first number designates the number of carbon atoms and the second number designates the number of double bonds.

B3

Claim 6 (twice amended) The compound of claim 1, wherein R1 is of formula V and R2 and R4 are independently a member selected from the group consisting of CH_3, C_2H_5, nC_3H_7 or isopropyl, with n being an integer from 1, 2 or 3.

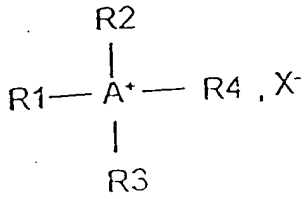
B4

Claim 13 (twice amended) The compound of claim 1 wherein R1 has the formula II, III or V, R5 consists of cholesteryl -[C(O)N-CH_2-CH_2-O] and R6 is ethyl.

B5

Claim 16 (twice amended) A compound according to claim 1 wherein R1 has the formula II, III or V, R5 consists of ($C_{18}H_{35}$) and R6 is 1,2-dioxyglycerol.

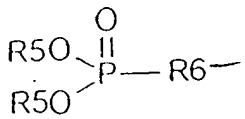
Claim 18 (twice amended) A vesicle comprising a compound of the formula



I

B6

wherein A is phosphorus; X^- is an anion; and wherein R1 is



V

wherein R5 is a lipid moiety and R6 is alkyl of 2 to 4 carbon atoms,

R2 and R4 are alkyl of 1 to 4 carbon atoms; and R3 is selected from

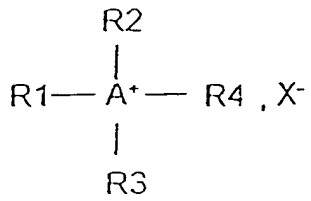
the group consisting of:

CH_2-CH_2P^+(R6R7R8), R6, R7 and R8 are alkyl of 1 to 4 carbon atoms and

- CH_2-CO_2R9, and R9 is alkyl of 1 to 4 carbon atoms.

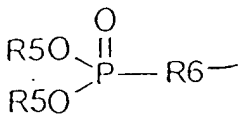
Claim 22 (twice amended) A method for introducing in vitro a nucleic acid in a cell host comprising the steps of:

a) incubating said nucleic acid with a compound of the formula



I

wherein A is phosphorus; X^- is an anion; and wherein R1 is



V

wherein R5 is a lipid moiety and R6 is alkyl of 2 to 4 carbon atoms,

R2 and R4 are alkyl of 1 to 4 carbon atoms; and R3 is selected from the group consisting of:

CH_2-CH_2P^+(R6R7R8), R6, R7 and R8 are alkyl of 1 to 4 carbon atoms and

- CH_2-CO_2R9, and R9 is alkyl of 1 to 4 carbon atoms to obtain complexes formed between said nucleic acid and said compound, and

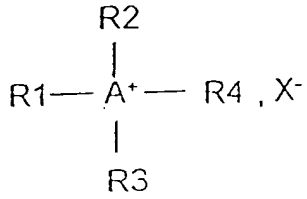
b) incubating the cell host with the complexes obtained at

B7

step a) whereby the nucleic acid is introduced into the cell host.

Claim 24 (twice amended) A method for introducing in vivo a nucleic acid into cells of a host organism comprising the steps of:

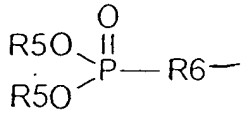
a) incubating said nucleic acid with a compound of the formula



I

wherein A is phosphorus; X^- is an anion; and wherein R1 is

B8



V

wherein R5 is a lipid moiety and R6 is alkyl of 2 to 4 carbon atoms,

R2 and R4 are alkyl of 1 to 4 carbon atoms; and R3 is selected from the group consisting of:

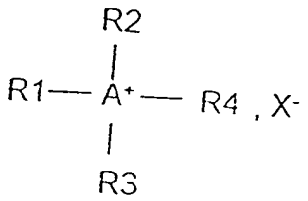
CH_2-CH_2P^+(R6R7R8), R6, R7 and R8 are alkyl of 1 to 4 carbon atoms and

- CH_2-CO_2R9, and R9 is alkyl of 1 to 4 carbon atoms

to obtain complexes formed between said nucleic acid and said compound; and

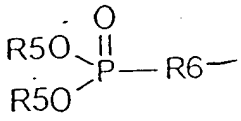
b) administering the complexes obtained at step a) to said host organism whereby said nucleic acid is introduced into the cell of the host organism.

Claim 26 (twice amended) A complex formed between a nucleic acid and a compound of the formula



I

wherein A is phosphorus; X^- is an anion; and wherein R1 is



V

wherein R5 is a lipid moiety and R6 is alkyl of 2 to 4 carbon atoms,

R2 and R4 are alkyl of 1 to 4 carbon atoms; and R3 is selected from the group consisting of:

CH_2-CH_2P^+(R6R7R8), R6, R7 and R8 are alkyl of 1 to 4 carbon atoms and

- CH_2-CO_2R9, and R9 is alkyl of 1 to 4 carbon atoms

to obtain complexes formed between said nucleic acid and said compound; and

b) administering the complexes obtained at step a) to said host organism whereby said nucleic acid is introduced into the cell of the host organism.